17 ASSESSMENTS, REVIEWS, AND LESSONS LEARNED

17.1 OVERVIEW

Assessments and reviews are essential to maintain confidence that project systems, processes, and technical efforts are integrated and coordinated effectively, throughout the Department of Energy (DOE). The process provides knowledge to make necessary decisions and to confirm project accomplishments.

Assessments and reviews provide evaluation of the continuing ability of the project to meet its technical and programmatic commitments. They also provide value-added assistance to the project manager as needed. The evaluation is applied throughout the life cycle of the project and consists of planning and conducting reviews and assessments during the project planning, execution, and closure.

All aspects of the review and assessment process should be subject to continuous improvement through a critical decision feedback process. At each critical decision stage in the process, feedback and continuous improvement should be realized. Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory enforcement actions occur.

Quality improvement, management assessment, and independent assessment processes should be included as a part of the project. The Preliminary Safety Analysis Report (PSAR) provides a valuable feedback mechanism to the design process through the activity of developing a defensible safety case, as well as through DOE line management and project independent reviews. In addition, an integrated team approach permits the feedback and continuous improvement processes to be functioning both at the formal and informal levels.

All reviews and assessments should be based on a tailored approach considering project-specific attributes, review/decision objectives, and project size. These reviews and assessments form a valuable body of knowledge for future projects and therefore should form the documented foundation for the lessons learned report.

The lessons learned process provides useful information that can be employed by DOE for current and future project teams. They are derived from assessment activities, directed action items, jeopardy items, issues, concerns, and corrective actions.

17.2 PURPOSE

The purpose of evaluation during the planning phase is to help to ensure that programs and projects support the mission goals and strategic plans. Evaluations also help establish that a project can be successfully performed within allocated resources and applicable constraints**.** Evaluation supports the process by developing recommendations and the supporting data necessary to arrive at decisions either to proceed or not to proceed with subsequent portions of project life cycles.

Evaluations during the execution phase helps to ensure that projects are being successfully executed according to plans and to also provide recommendations for improving the scope, cost, and schedule performance of the project. Evaluations should start during the planning phase and continue through the implementation phase.

Lessons learned provide managers with the opportunity to review summary documentation of previous issues and their mitigation efforts, and to incorporate that experience into similar projects.

17.3 APPLICATION

Providing a consistent review and assessment process at each critical decision point ensures adequate control of resources in meeting project objectives. Documenting these assessments provides the value-added benefit of including the lessons learned in the project and agency body of knowledge.

Reviews are essential for the project manager to maintain confidence that project systems, processes, and technical efforts are integrated and effectively coordinated. Reviews also help ensure that the project is progressing at an effective and acceptable rate.

Each project has phases through which it evolves. A clear understanding of these phases permits better control and use of resources in achieving goals. Regardless of size and complexity differences, projects consist of preconceptual activities, a conceptual phase, an execution phase, acceptance, and turnover. The following sections describe the purpose of reviews, the governing body, and the various decision points of the critical decision process.

17.3.1 Energy Systems Acquisition Advisory Board (ESAAB)

The ESAABs serve as both advisors to their respective DOE management levels, and as change boards for Level-0 change requests. The functions and membership of these boards is discussed in the following paragraphs.

- *MS Project ESAABs.* The ESAAB advises the SAE in making MS project CDs, Level-0 baseline changes, and site selections for facilities for new sites. The ESAAB meets once every two months, or at the call of the SAE. ESAAB membership includes the SAE as chair; the Under Secretaries; the General Counsel; the Chief Financial Officer; the Director of OECM; the Assistant Secretary for Environment, Safety and Health; the Assistant Secretary for Environmental Management; the Deputy Administrator for Defense Programs; the Director for Office of Science; and the Director of Procurement and Assistance Management. The Deputy Secretary may designate other PSOs or functional staff as board members, as needed. The ESAAB Secretariat resides in OECM and provides administrative and analytical support and recommendations to the ESAAB.

- *Other Project ESAABs.* Each appropriate PSO appoints an ESAAB-equivalent board for advising on actions regarding those projects within the PSO office that are not MS projects. The PSO serves as AE for these projects and as chair of the ESAAB-equivalent board. The ESAAB-equivalent board replicates and conducts the same functions as those performed by the corporate ESAAB. Members may be selected from within the PSO's office or from other Headquarters functions having departmental responsibility. At least one member is from a different PSO office and is designated by the contributing PSO. OECM provides a member of each ESAAB-equivalent board for projects $100M and greater. Each PSO provides the composition of its ESAAB-equivalent board to OECM.

- *Delegated Other Project ESAABs.* The PSO may delegate equivalent AE functions, including decision approvals, for those other projects below $100M to an SES program manager or an operations/field office manager. For those delegated other projects less than $20M, the program manager or operations/field office manager may further delegate equivalent AE functions to a direct reporting SES subordinate. Figure 17-2 provides an overview of the allowable AE delegations. The AE so designated establishes and chairs an ESAAB-equivalent board, notifies OECM of its composition, invites OECM to all board meetings, and provides all agendas and minutes to OECM and the appropriate PSO project management support office. However, OECM is not a board member.

Table 17.1

ESAAB/ESAASB
Review and Assessment Checklist

Program_____ **Project**_____ **Date**_____

CD-0 CRITERIA

- Have the program's strategic goals and objectives been addressed? YES ❑ NO ❑
- Are the projects objectives, requirements, priorities, and constraints documented? YES ❑ NO ❑
- Has a Risk Management Plan associated with the project been identified, analyzed, and determined to be either avoidable or manageable? YES ❑ NO ❑
- Has the Mission Need Document and preproject planning activities been completed? YES ❑ NO ❑
- Have all issues been identified, resolved, and documented? YES ❑ NO ❑

CD-1 CRITERIA

- Is the risk identification and analysis complete? YES ❑ NO ❑
- Is the conceptual design report complete? YES ❑ NO ❑
- Has the Acquisition Plan, including all its elements, been completed? YES ❑ NO ❑
- Has the preliminary project execution plan, including baseline range and documents, been submitted for SAE/AE approval? YES ❑ NO ❑
- Have validated project data sheets for design been completed? YES ❑ NO ❑
- Have all issues been addressed, resolved, and documented? YES ❑ NO ❑

CD-2 CRITERIA

- Are project engineering and design (PED) funds available for use for Title I and Title II for the project? YES ❑ NO ❑
- Has the contractor's performance measurement system been reviewed and validated? YES ❑ NO ❑
- Has the independent cost estimate been completed and verified? YES ❑ NO ❑

- Has a Preliminary Safety Analysis report been completed? YES ❑ NO ❑
- Has a National Environmental Policy Act, and Record of Decision been documented? YES ❑ NO ❑
- Have the project plan and performance baseline been updated? YES ❑ NO ❑
- Have the project construction data sheets been completed? YES ❑ NO ❑
- Have all issues been resolved and documented? YES ❑ NO ❑

CD-3 CRITERIA

- Has the project been included in the budget submittal process? YES ❑ NO ❑
- Has the project plan and performance baseline been finalized? YES ❑ NO ❑
- Has Title II design or procurement activities been initiated? YES ❑ NO ❑
- Has the program office verified that this project supports the Mission need? YES ❑ NO ❑
- Have all issues and or jeopardy items been identified, addressed, and documented? YES ❑ NO ❑

CD-4 CRITERIA

- Have all activities been executed and completed, including construction? YES ❑ NO ❑
- Have the operational readiness review and acceptance report been completed? YES ❑ NO ❑
- Has the safety documentation been completed and approved? YES ❑ NO ❑
- Has the project closeout report and its supporting documentation been completed? YES ❑ NO ❑
- Have all issues been closed out and documented? YES ❑ NO ❑

Project Type	Critical Decision Authority	Typical Project Requirements	Acquisition Executive Delegation Allowed
Major System Projects	Secretarial Acquisition Executive	**$400M** Quarterly review by PSO Performance Baseline External Independent Review (EIR) Execution Readiness EIR Energy System Acquisition Advisory Board Earned Value Management System reporting required	
Other Projects	Program Secretarial Officer (Acquisition Officer) or Deputy Administrator for NNSA	**$100M** Quarterly review by PSO Performance Baseline EIR Execution Readiness Independent Project Review Energy System Acquisition Advisory Board - equivalent Earned Value Management System reporting required	**Acquisition Executive Delegation Allowed**
		$20M Quarterly review by Program Secretarial Officer or delegate Performance Baseline EIR Execution Readiness Independent Project Review Energy System Acquisition Advisory Board - equivalent Earned Value Management System reporting required	To a Senior Executive Service program manager or operations/ field office manager
		$5M Quarterly review by Program Secretarial Officer or delegate Performance Baseline EIR Execution Readiness Independent Project Review Energy System Acquisition Advisory Board - equivalent Earned Value Management System reporting NOT required	To a Senior Executive Service direct reporting subordinate of the operations/ field office manager

Figure 17-2. Decision Authority Thresholds

17.3.2 DOE Data Repository

The DOE data repository, maintained by OECM, will provide project management reporting that includes scope, cost, and schedule performance. Headquarters and other major milestone information will be included. The repository will contain a review and assessment checklist (Figure 17-1) for all projects presented to the ESAAB Boards, noting their progress through the critical decision phases. Data is preserved throughout the life cycle of each project proposed and approved. In addition, the repository will contain information regarding issues and jeopardy management items and identify corrective actions. The Issue/Action Item and

Jeopardy Form is designed to accommodate either general issues or specific action items. It is also used for jeopardy issues that may require escalation to higher levels of management. The Issues/Jeopardy tracking log is maintained by each project to track all issues or actions originating from an ESAAB, or from agency or management requests. These documents become an integral part of the "Lessons Learned" file that will be available for evaluation, application on future projects. The project manager will coordinate updates from the field to OECM on a monthly and/or quarterly basis.

17.3.3 Mission/Program Documentation Review and Assessment

The program offices, in partnership with the originating office, submits the Justification of Mission Need and the preconceptual planning documentation to the Deputy Secretary of Energy and his review board (ESAAB) for review and assessment. Prior to the submission of the mission need statement for ESAAB approval, a mission need independent project review will be performed to assure that the mission is credible, justifiable, alternative solutions have been considered, and that the mission need statement is ready to proceed for consideration. When submitted, the documentation should contain short, qualitative information with a primary focus on mission needs. The Deputy Secretary of Energy may approve the mission need documents, approve mission need (CD-0), and the funding request, or they request modification or terminate further project efforts. Approval of CD-0 confirms that the proposed project supports the DOE mission, initiates "formal" start of the project, and authorizes development of the conceptual design and supporting studies to adequately define the project. Documentation supporting the decision should include a preliminary analysis of risk, including technical, schedule, and cost, together with the potential impact on Departmental resources. The preliminary analysis serves to identify issues and opportunities to be addressed during the conceptual phase.

For projects explicitly directed and initiated by Executive Order or a Congressional Act and executed in accordance with Federal Facility Agreements, Tri-Party Agreements, or Presidential or Secretarial Announcement, the direction or edict serves as the mission need critical decision CD-0.

17.3.4 Conceptual Phase Review and Assessment

Conceptual design is the initial formal project phase. Products developed during conceptual design for review and assessment include Acquisition Plan, Conceptual Design Report, Project Execution Plans baseline ranges, Project Data Sheet

for design, verification of mission need and Preliminary Hazard Analysis Report. All details associated with the conceptual phase are the responsibility of the Program Office and the originating field office sponsor. The conceptual phase also marks the organization of the Integrated Project Team (IPT) with the Federal Design Manager, the Federal Project Manager and the DOE Field Office, the Contractor Project Managers, and others as designated by the Federal Project Manager.

For all projects, the appropriate AE conducts a quarterly project performance review with the Federal project manager and staff. The contractor may participate in this review as appropriate. For MS projects, the schedule and agenda are coordinated with OECM, and OECM is invited to participate with the PSO in the review. Quarterly performance reviews for other projects with TPCs less than $100M may be delegated to a program manager or operations/field office manager. The contractor may participate in this review as appropriate. OECM is invited to participate in all performance reviews for projects with a TPC over $5M.

17.3.5 Preliminary Design Phase Review and Assessment

The conceptual design phase review and assessment is performed to verify that sufficient progress has been achieved, level of information has been developed, and requirements have been satisfied to allow the expenditure of PSD funds for project design. During conceptual design, the project manager ensures completion and submittal of the Project Data Sheet for construction, National Environmental Policy Act documentation, Preliminary Safety Analysis Report, and Final Project Execution Plan, including the performance baselines. A review of the responsible contractor's project management system, and preparation of an independent cost estimate are also completed to ensure compliance and validation of data.

For projects with a TPC of $5M or greater, an External Independent Review (EIR) may be initiated in response to an external requirement. The Deputy Secretary or the Program Office may request the review with the Office of Engineering and Construction Management (OECM) who arrange for the EIR.

With confirmation of all aspects of the preliminary design phase review and assessment completed, Approve Performance Baseline, CD-2, is approved. OECM updates and records the data in the DOE Repository.

For environmental projects, pertinent data and baselines developed by the field offices and included in the Initial Paths to Closure document will be considered as "Approved for Use" by the Office of Environmental Management.

17.3.6 Final Design and Construction Review and Assessment

With approvals by the appropriate ESAAB to begin final design and project construction, final document updates occur. These include the Project Execution Plan and performance baseline, verification of mission need, safety documentation, and design and procurement packages to the degree appropriate to initiate construction. Construction, in this sense, is a generic term that may refer to engineering development, physical construction, or remedial actions, etc. A CD-3 report also requires the performance of an Execution Readiness Internal Review. The review initiates the request for budget and congressional authorization and appropriation. Critical Decision (CD-3) is approved after confirmation of completion and verification of documents listed above, and the expenditure of funds has been documented. All data reviewed by the board is documented in the DOE repository including "lessons learned" for future potential evaluation.

17.3.7 Project Closeout/Operations Review and Assessment

Prior to project closeout or start of operation, the cognizant project manager will coordinate acceptance/completion documentation to support Critical Decision (CD-4). These documents include the operational readiness review and acceptance report, the Final Safety Analysis Report, and the project transition-to-operations report. Not all projects will undergo transition activities, but may proceed directly to closeout as prescribed by project planning documentation. In this case, a final project closeout report is completed and submitted for review by the ESAAB. Verification of the closeout plan will include the following:

- Roles, responsibility, and authority of the personnel for safe closeout of the project
- Alternative use studies or approvals
- Decommissioning planning, if required
- Closeout approval
- Permits, licenses, and/or other environmental documentation
- Relocation of resources

- Post-project reviews
- Termination or closeout of contracts
- Lessons learned
- Submission of final closeout reporting and any adjustment to obligations and costs.

For projects transitioning to a user, the user and project organizations will perform tests and evaluations to ensure that the project, as designed and built, can be safely operated and meets project mission requirements. Transition of the project to the user concludes with the final acceptance of the facility by the user organization, and is reported to the ESAAB for inclusion by OECM in the DOE repository.

17.4 INDEPENDENT REVIEWS

Credible and independent reviews of each project is an expectation of Congress, OMB, local stakeholders, Tribal Nations, and DOE. Headquarters program offices, operations/field offices and the project manager will conduct periodic onsite reviews and assessments of project status throughout project development and execution, as well as, review and analyze project reporting. Reviews will be conducted to assure continuing progress, appropriate planning and development, effective use of funds, mission need, etc. An independent review is conducted by a non-proponent of the project. It may be a science-based or engineering-oriented peer review, a review of the project management structure and interrelationships between key organizational components, a review targeted to a specific issue such as cost or budget, a review covering safety, or a combination thereof. Independent reviews may be combined for efficiency, as appropriate. The completion of a rigorous independent review should reduce the need to perform additional resource-consuming audits and reviews by other organizations.

17.4.1 External Independent Reviews (EIR)

An EIR is conducted by reviewers outside the department. OECM will select an appropriate contracting agency to contract for such reviews, excluding the M&O/M&I contractors. The actual selection of reviewers, contract management and contact with the contracting officer, and dialogue with the EIR contractor on matters pertaining to the contract are the sole purview of OECM.

All EIRs are managed by OECM and documented in the data repository. The following components are planned and coordinated with the appropriate line manager:

- Specific review scope and objectives
- Organizations/personnel to be reviewed
- Evaluate identities of reviewing organization and individuals
- Select an appropriate (nontypical) review team
- Risk area (to be reviewed at greater levels of detail)

The PSO's project management support office provides coordination for the EIR contractor on site, resolves issues of schedule and access while on site, gathers and provides requested and proffered information to the reviewer, and responds to the reviewer on errors of fact or needed clarification. The project management support office does not provide direction to the reviewer as to the content of the reviewer's report.

Line management, including the Deputy Secretary, PSO, or a program or project organization within the PSO may request an EIR. EIRs also may be initiated in response to an external requirement. However, reviews, studies, or investigations conducted by the General Accounting Office or the Office of the Inspector General are not considered EIRs for DOE purposes.

A tailored approach should be applied in determining the quality and level of detail to be reviewed. Simpler areas that offer low risk of project impact should receive less scrutiny than high-risk areas, those potential costly areas, or areas on which problems seem to be developing. External technical reviews are used to determine if complex issues exist, and for assistance in the resolution of such issues. If a design is new, untried, and unproven, and no standards against which judgments regarding viability can be made, a review by appropriately trained and knowledgeable experts is in order. Technical reviews include reviews of the contractor's project control system.

17.4.2 Independent Project Reviews (IPRs)

An IPR is conducted by reviewers within the department. The Deputy Secretary or SAE, or the PSO and the operations/field office manager and program managers and Federal project managers, may authorize or conduct IPRs as required. The PSO or operations/field office manager, as part of the project management over-

sight process, may request IPRs through the project management support office for any project, including MS projects. Irrespective of the organizational level initiating an IPR, the PSO or operations/field office manager notifies OECM of its intent to conduct such a review, and OECM is included as an invited observer for all planned reviews. OECM coordinates the extent of participation on a case-by-case basis with the appropriate organization. Committee members of an IPR team are not drawn from the responsible program office within a program secretarial organization, related contractors from the project office, or a related funding program. Reviews may use laboratory, contractor, university, or other expertise from organizations not directly funded by or related to the program/project office being reviewed.

Decision Point Reviews are documented by OECM during the ESAAB process.

17.4.3 Performance Reviews

For all projects, the appropriate AE conducts a quarterly project performance review with the Federal project manager and staff. The contractor may participate in this review as appropriate. For MS projects, the schedule and agenda are coordinated with OECM, and OECM is invited to participate with the PSO in the review. Quarterly performance reviews for other projects with TPCs less than $100M may be delegated to a program manager or operations/field office manager. The contractor may participate in this review as appropriate. OECM is invited to participate in all performance reviews for projects with a TPC over $5M.

Performance reviews should utilize a tailored approach to project-specific attributes, review/decision objectives, project status, size and complexity.

17.4.4 Independent Cost Estimates (ICEs)

ICEs are used primarily to verify project cost and schedule estimates and support the CD-2 process in establishing project performance baselines. ICEs are part of the Performance Baseline EIR, although, and ICE can be combined with any EIR or IPR for efficiency. ICEs may be requested at other times and for other reasons. OECM functions as DOE's agent, working through appropriate contracting officers to establish contracts for ICEs. ICEs are documented in formal reports submitted to the SAE/AE by OECM. Each ICE is reconciled with the current program office estimate by the Federal project manager.

17.4.5 Mandatory Independent Reviews

The following reviews shall be conducted on all projects over $5M, as described in the acquisition sequence (see Chapter III, Paragraph 3):

- *Mission Validation IPR.* This is a limited review of the project prior to CD-0. It validates the mission need and the funding request.
- *Performance Baseline EIR.* This is a detailed review of the entire project, including an ICE, prior to CD-2. It verifies the mission need; validates the proposed technical, cost, and schedule baseline; and assesses the overall status of the project management and control system.
- *Execution Readiness EIR or IPR.* This is a general review of the project prior to CD-3 that may range from an abridged review of specific areas within a project to a comprehensive review of the entire project. As a minimum, it verifies the readiness of the project to proceed into construction or remedial action.

17.4.6 Other Project Reviews

A number of opportunities exist throughout the project life cycle to use the review process to implement and enhance project execution. A few examples are given that are fairly standard in use during the evolution of the project, e.g., design reviews, environmental assessments, safety analysis review, operational readiness review, etc. The use of nonadvocate experts to supplement the project staff is an approach that can bring credible industry expertise and resources to bear on the project. This can significantly broaden the review viewpoint.

Reviews are held to determine if a product is correct, will perform its intended functions, and meet established requirements. Reviews are also used to determine the current condition of a project. Reviews are an integral part of the project and should be planned in advance and used to complement the line organization's responsibilities.

17.5 LESSONS LEARNED

The lessons learned process shall be established to create a strategy that ensures continuous improvement on all projects. The process shall involve DOE and contractor participation.

The intent is to provide effective and enhanced information to assist existing and future projects. To do so, the process must capture information from pertinent reviews throughout the life cycle of each project. Two processes are involved: development and incorporation. Development includes the identification, documentation, validation, and dissemination of lessons learned data. Incorporation includes associating lessons learned outcome to applicable project activities for specific improvement actions.

The process is to produce a coordinated system for performance evaluation and facilitation of improvements. Contractor management and internal assessment is the preferred way to create a continuous improvement environment. This evaluation should use a tailored approach and focus on key activities associated with project goals. Areas with the greatest consequence for failure should receive particular emphasis.